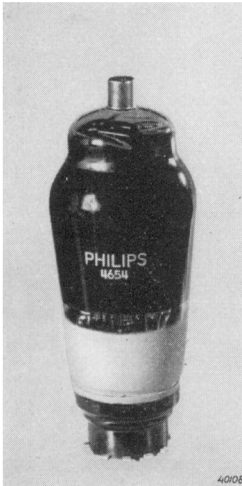


"Miniwatt" SPECIAL VALVES

HIGH-POWER OUTPUT PENTODE

4654



CHARACTERISTICS

Heater voltage	V_f	=	6.3		A
Heater current	I_f	=	1.35		V
Anode voltage	V_a	=	400	600	V
Screen-grid voltage	V_{g_2}	=	425	400	V
Suppressor-grid voltage	V_{g_3}	=	0	0	V
Anode current	I_a	=	45	22	mA
Screen-grid current	I_{g_2}	=	5	2	mA
Grid bias	V_{g_1}	=	-33	-37	V
Slope	S	=	6	4	mA/V
AC resistance	R_1	=	30	50	k Ω
Maximum output from two valves in Class AB push-pull with fixed grid bias	W_{omox}	=	52.5	69	W
Total distortion	d_{tot}	=	3.7	5.2	%
Required input per valve	V_i	=	25	25	V (RMS)
Optimum load (anode to anode)	R_a	=	5	10	k Ω

SPECIAL ADVANTAGES

1. Very high efficiency
2. Large output
3. Comparatively low anode voltage

DESCRIPTION

The 4654 is an indirectly heated 18 W output pentode, designed especially for Class AB push-pull stages. To avoid risk of arcing at the pinch, the valve has its anode connected to a top cap.

The suppressor grid is taken to a separate contact on the base, and the valve may accordingly be used as a transmitter. As an amplifier, the 4654 offers various possibilities; in addition to its application to power amplifiers, the valve may be used as a modulator. In the case of push-

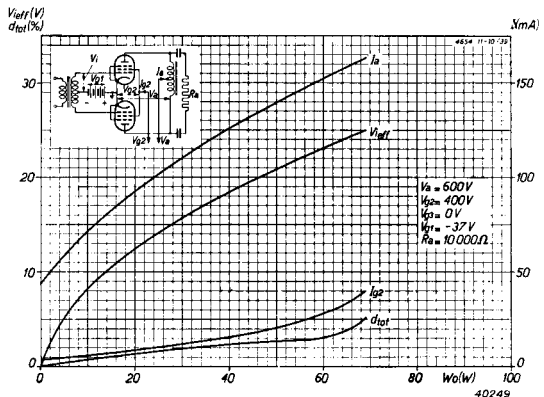


Fig. 2.

Anode current, screen-grid current, required input V_{ieff} (RMS) and total distortion shown against output power for 2 valves 4654 in push-pull with fixed grid bias, $V_a = 600$ V and $V_{g_2} = 400$ V.

pull stages, it is inadvisable to employ high anode voltages unless the grid bias is fixed. With 600 V on the anodes and 400 V on the screen grids, a pair of valves will supply 69 W output, at 5.2% total distortion; to achieve this figure, it is necessary to keep the screen potential as nearly constant as possible. Alternative operating conditions are: anode voltage 400 V, screen-grid voltage 425 V; in that case, with fixed grid bias, the power output is 52.5 W, at 3.7% distortion; with automatic bias, the output is 30 W, the total distortion amounting to 10%. With the second set of operating conditions mentioned above there is the advantage that the screen grids may be connected directly to high-tension positive; the respective anode and screen potentials have been chosen to allow for a voltage drop of 25 V in the output transformer. For wavelengths down to 50 metres, the 4654 may be used for transmitting; in a telegraphy transmitter, a Class C stage using this valve provides a carrier-wave output of 36 W, the efficiency being 67%. The 4654 pentode is particularly suitable for combined anode and screen modulation; with an anode voltage of 200 V and -60 V grid bias, an output of 24 W is obtainable.

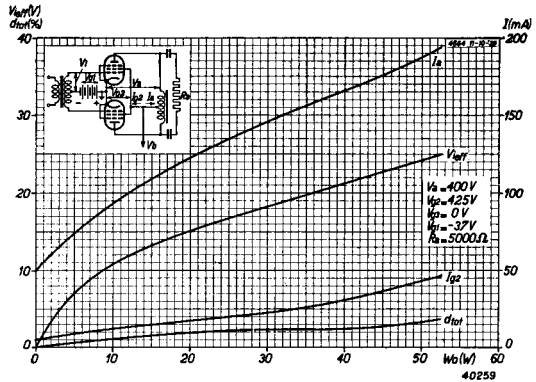
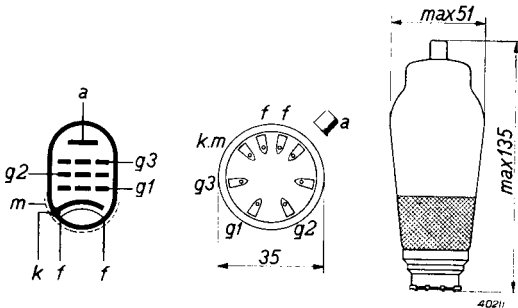


Fig. 3.

Anode current, screen-grid current, required input V_{ieff} (RMS) and total distortion shown against output power for 2 valves 4654 in push-pull with fixed grid bias, $V_a = 400$ V and $V_{g2} = 425$ V.



Arrangement of electrodes; connections and maximum dimensions in millimetres